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MEHTA CASTING

Surgical Specialty:	Orthopedic Surgery
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Background:

- General Considerations
  - Mehta casting is used for the treatment of early-onset scoliosis (EOS).
  - Serial derotational casting is typically performed under general anesthesia with the goal of limiting progression, providing correction of the curve, or delaying surgical intervention.
  - Higher treatment succes is associated with younger age of initiating treatment (prior to 2 years of age) and curves with a less severe Cobb angle.
- Patient Considerations
  - Patients with EOS may have associated comorbidities, including cardiac abnormalities, pulmonary complications of scoliosis, renal abnormalities, neurologic abnormalities (i.e., Chiari malformations, tethered cord, syrinx), and bone/muscular diseases.
- Associated Comorbidities/Syndromes
  - EOS may be idiopathic or may be associated with a genetic syndrome, neuromuscular disease, or congenital malformation.

Anesthetic Planning:

- Pre-Anesthetic Evaluation
  - Patients with EOS should be evaluated by their pediatrician for associated comorbidities, as listed above.
  - Additional labs/tests depend on the cause of scoliosis and associated comorbidities and may include CXR, PFTs, echocardiogram, MRI spine, etc.
  - Discussions to have with surgeon/family
    - Consent the patient's family for general endotracheal anesthesia (GETA) and discuss the risks associated with positioning, including the possibility of a tongue laceration.
    - Discuss the plan with the surgeon regarding positioning, assistance with holding the patient while on a specialized casting table, and the possibility of reduced pulmonary compliance after casting.
- Specific or Unique Room Set-Up Requirements
  - Airway

        - Plan for GETA due to positioning concerns and the possibility of reduced pulmonary compliance.
        - Bite blocks
    - Drugs/Infusions
        - Consider preoperative anxiolysis as these patients will often have multiple castings under general anesthesia.
        - Inhalational or intravenous anesthetic technique as indicated.
        - Consider prophylaxis for emergence delirium.
    - Monitors
        - Standard ASA monitors are used for the procedure.
        - Need for monitors that are long enough to reach the specialized casting table
            - EKG cables must be long enough to put the leads on the distal extremities while casting.
        - Temperature regulation in the Operating Room(OR)
            - Patients are young and often small in size, which puts them at risk for perioperative hypothermia.
            - Convection warming systems cannot be used due to patient positioning and the use of a specialized table.
    - PICU Bed Availability
        - Not typically required unless the patient's comorbidities warrant a PICU admission.

Intraoperative Considerations:

- General
    - Deep plane of general anesthesia without patient movement is needed while on the specialized casting table.
    - GETA is typically required due to positioning concerns on the casting table, prone positioning that occurs during the casting, and changes in pulmonary compliance that may occur with distraction and casting.
    - Typically, induction and intubation are performed on a standard OR table before moving the patient to the casting table.
- Induction
    - Inhalational induction is typical in this age group unless otherwise contraindicated.
    - May consider neuromuscular blockade to avoid patient movement while on the casting table.
    - Peripheral IV should be placed as distally as possible to avoid disruption of the casting area.
- Positioning
    - Positioning is extremely important as a specialized casting table is utilized.
    - Team coordination and communication are vital to keep the patient in a safe position on the casting table. The anesthesiologist should control the patient's head, neck, and airway unless otherwise delegated.
    - Bite blocks should be placed to avoid tongue laceration due to the halter strap that is placed under the chin during the procedure.
    - Ear protection should also be placed due to the halter strap on the face.
    - Typically, the blood pressure cuff is placed on either lower extremity as the upper extremities are close to the casting area.
- Maintenance
    - Maintain a deep plane of general anesthesia while on the specialized casting table.

- Hemodynamic/Physiologic goals
    - Standard hemodynamic goals based on age and comorbidities.
    - Pulmonary compliance may decrease after casting. A thoracoabdominal window is often cut to assist with this.
- Surgical Considerations (such as neuromonitoring, muscle relaxation, anticipated blood loss)
    - Ear protection and bite blocks are needed due to the placement of a halter strap under the chin and around the face.
    - Neuromuscular blockade is usually not required for this procedure but may be useful to prevent patient movement while on the casting table.
- Emergence/Disposition
    - Patients may be at risk for emergence delirium due to age and repeated procedures.
- Post-op Pain
    - Typically, not a significant issue after this procedure.

Case-Specific Complications/Pitfalls

- Positioning
    - Casting involves difficult positioning. Communication is of utmost importance throughout this procedure.
    - After casting, inspect the patient's face for pressure-related injury including tongue laceration, chin/cheek/ear trauma.
- Pulmonary compliance
    - Pulmonary compliance often decreases with casting. Therefore, communication with the surgeon is important, and adjusting the cast may be necessary.

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